

# NASA TECH BRIEF

## *Marshall Space Flight Center*



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### Water Impact Loads

#### The problem:

To be able to generate time history of load factor and pressure at the water line of a conical body of revolution impacting water.

#### The solution:

A computer program was developed to do the above calculations.

#### How it's done:

This program calculates a time history of depth of penetration, velocity, force, load factor, maximum pressure at the water line, and average pressure for a body of revolution impacting water. The nose shape of the body can be conical or a truncated cone frustum with a spherical nose cap. Forces on the body during submergence of the nose section are based on virtual mass theory.

For submergence past the nose cone, body motion is determined by hydrodynamic drag. Either a drag coefficient for the body is calculated to balance the forces from the virtual mass theory at the intersection of the cylinder and nose cone or a coefficient of drag can be input to replace the calculated value.

Some possible uses of the program are for military ordinance, water recovery of space and military vehicles, and dropping of commercial or military payloads from aircraft.

#### Notes:

1. This program is written in FORTRAN IV Level H for the IBM-360/85/195 Release 20.1 computer. However, the program has been compiled on an IBM-360/65 computer.
2. Inquiries concerning this program should be directed to:

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